

# Curriculum Vitae

## PRESENT ADDRESS

Room No. 1401, Building No. 308, The Seo Group, Energy and Chemical Engineering Dept., Ulsan National University of Science and Technology, 50, UNIST-gil, Eonyang-Eup, Ulju-gun, Ulsan-44919, Republic of Korea  
Phone: + (82) 1059361744, Email: srikantapalei5@gmail.com



## PERSONAL INFORMATION

Name : Srikanta Palei

Date of Birth : 5<sup>th</sup> April 1986

Sex & Marital Status: Male, Married

Nationality : Indian

## CAREER OBJECTIVE

A thoughtful inquisitive into the changing and improving technological aspects and desire to innovate and explore undefined or more in the existing phenomena. Being a part of the science and technology community, I will try to put my best efforts to be a good researcher and academician.

## EDUCATION

- 2018 Ph.D., **98.1%**, College of Engineering, Dept. of Mechanical Engineering, Jeonbuk National University, Jeonju, Republic of Korea.  
Supervisor: Prof. Keunjoo Kim.
- 2011 M.Phil. in Physics, **72%**, School of Physics, Sambalpur University, Sambalpur, Odisha, India  
Supervisor: Prof. Pratibindhya Nayak
- 2009 M.Sc. in Physics, **72%**, Dept. of Physics, Solid State Physics (Specialization Paper), Berhampur University, Odisha, India

## RESEARCH EXPERIENCE

### M. Phil.

Thesis supervisor: Prof. Pratibindhya Nayak

Topic of research: Size and shape dependent properties of nanostructured materials

Period: 1<sup>st</sup> January 2010-20<sup>th</sup> July 2011

Place: School of Physics, Sambalpur University, Burla, Odisha, India

## **Project**

Project leader: Prof. Rajan Jha

Topic of research: Design and development of plasmonic based biosensor for infrared

Period: 9<sup>th</sup> November 2011-30<sup>th</sup> June 2013

Place: School of Basic Sciences, IIT Bhubaneswar, Odisha, India

## **Ph. D.**

Thesis supervisor: Prof. Keunjoo Kim, Jeonbuk National University, Republic of Korea.

Topic of research: Fabrications and Characterizations of GaAs Heterojunction Structured Large-Scale Si Solar Cells.

Period: 10<sup>th</sup> March 2014-22<sup>nd</sup> August 2018

Place: Mechanical Engineering Dept., College of Engineering, Jeonbuk National University (Earlier Chonbuk National University), Jeonju, Republic of Korea

## **I. Post-doctoral Researcher**

Topic of research: Fabrications and Characterizations of Si Solar Cells based on silicon-on-insulator nanostructures

Project leader: Prof. Keunjoo Kim

Period: 12<sup>th</sup> September 2018 – 15<sup>th</sup> October 2018

Place: Dept of Mechanical Engineering, College of Engineering, Jeonbuk National University, Jeonju, Republic of Korea.

## **II. Post-doctoral Researcher**

Topic of research: Perovskite and Silicon HIT solar cells Project

leader: Prof. Kwanyong Seo

Period: 16<sup>th</sup> October 2018 – Present

Place: School of Energy and Chemical Engineering (ECHE)., Ulsan National Institute of Science and Technology (UNIST), Ulsan, Republic of Korea.

## **RESEARCH AREA:**

**GaAs heterojunction Structured Si solar cells (Ph.D. work)**, Silicon solar cells, Nanotexturing by Metal Assisted Chemical Etching, Surface passivation, Thin Film Deposition, Simulation for Plasmonics-based Sensor and Theoretical study of size and shape-dependent melting temperature of nanostructured materials.

**Perovskite Solar cells:** Solvent additive effects on Pb-based perovskite solar cells, Surface passivation by different functional groups.

# Curriculum Vitae

## RESEARCH/SCIENTIFIC SKILLS

**Analytical skills:** Experience in handling analytical instruments like UV-Visible spectrophotometer, FT-IR spectrometer, optical microscope, Scanning electron microscope, Raman Spectroscope, Transmission electron microscope, Wide angle X-ray diffraction and, QSSPC  $\mu$ -PCD, Electroluminescence, Fluorometer, Photoluminescence, Solar simulator, thermal evaporator, e-beam evaporator etc.

**Computer skills:** Adapt knowledge in various programming software such as: FOTRAN, MATLAB, GNUMPLOT, XMGR, LATEX, Origin, Image J, Digital Micrographs, AFORS-HETv2.5 software and SCAPS.

## LIST OF PUBLICATIONS

1. P. K. Maharana, R. Jha, and **S. Palei**, Sensitivity enhancement by air mediated graphene multilayer based surface plasmon resonance biosensor for near infrared, Sensors and Actuators B: Chemical, Elsevier, 190, 494-501 (2014).  
<https://doi.org/10.1016/j.snb.2013.08.089>
2. B. Parida, J. Choi, **S. Palei**, K. Kim, and S. J. Kwak, Nanotextured Si Solar Cells on Microtextured Pyramidal Surfaces by Silver-assisted Chemical Etching Process, Transactions on Electrical and Electronic Materials, Springer, 16 (4), 212-220 (2015).  
<http://dx.doi.org/10.4313/TEEM.2015.16.4.212>
3. B. Parida, J. Choi, **S. Palei**, K Kim, and S. J. Kwak, Nanopyramid Formation by Ag Metal-Assisted Chemical Etching for Nanotextured Si Solar Cells, Transactions on Electrical and Electronic Materials, Springer, 16 (4), 206-211 (2015).  
<http://dx.doi.org/10.4313/TEEM.2015.16.4.206>
4. J. Choi, **S. Palei**, B. Parida, S.Y. Ko, and K. Kim, Nanoporous Anodic Edge Passivation of Si Solar Cells, Journal of Nanoscience and Nanotechnology, American Scientific Publishers, 15 (11), 8864-8869 (2015).  
<https://doi.org/10.1166/jnn.2015.11522>
5. **S. Palei**, G Lim, B Parida, J Choi, and K. Kim, Effect of hydrogen defects on nanocrystallite layers of Si solar cells by hydrogen implantation, Radiation Effects and Defects in Solids, Taylor and Francis, 170 (11), 916-925 (2015).  
<https://doi.org/10.1080/10420150.2015.1136626>

6. B. Parida, G. Lim, J. Choi, **S. Palei**, and K. Kim, Hydrogen passivation effect on the conversion efficiency of Si solar cells by low-energy proton implantation, *Solar Energy*, Elsevier, 122, 486-496 (2015).  
<https://doi.org/10.1016/j.solener.2015.08.041>
7. **S. Palei**, B. Parida, J. Choi, and K. Kim, Nanomosaic Si Solar Cells with GaAs Thin Film on Si Micro/Nanotextured Surfaces by Electron Beam Evaporation, *Journal of Nanoscience and Nanotechnology*, American Scientific Publishers, 16 (10), 10569-10574 (2016). <https://doi.org/10.1166/jnn.2016.13197>
8. B. Parida, S. Palei, J. Choi, and K. Kim, Formation of Nanopyramidal Structures on Microtextured Si Surfaces for Solar Cell Application, *Journal of Nanoscience and Nanotechnology*, American Scientific Publishers, 16 (10), 10482-10489(2016).  
<https://doi.org/10.1166/jnn.2016.13181>
9. J. Choi, B. Parida, **S. Palei**, and K. Kim, Schottky-type edge passivation of silicon solar cells, *Solar Energy Materials and Solar Cells*, Elsevier, 159, 20-25 (2017).  
<https://doi.org/10.1016/j.solmat.2016.08.033>
10. **S. Palei**, R. Sahu, J. Mun, K. Kim, Inclusion of GaAs Heterojunction Window layers on the Emitters of Si Solar Cells, *Nanoscience and Nanotechnology Letters*, American Scientific Publishers, 10, 4, 474-478 (2018). <https://doi.org/10.1166/nnl.2018.2676>
11. R. Sahu, S. Palei, J. Mun, K. Kim, Silicon Solar Cells with Embedded Silicon-on-Insulation Layer by Nitrogen Ion Beam Implantation, *Physica Status Solidi A*, Wiley, 215, 1701018 (2018). <https://doi.org/10.1002/pssa.201701018>
12. J. Mun, **S. Palei**, R. Sahu, J. Choi, K. Kim, Thermal annealing effect on the conversion efficiency of Si solar cells, *Journal of Nanoelectronics and Optoelectronics*, American Scientific Publishers, 13, 10, 1557-1563 (2018). [doi:10.1166/jno.2018.2391](https://doi.org/10.1166/jno.2018.2391)
13. R. Sahu, **S. Palei**, J. Choi, K. Kim, Nitrogen Ion Implantation Effect on Silicon Solar Cells for Surface Passivation, *Journal of Nanoelectronics and Optoelectronics*, American Scientific Publishers, 13, 10, 1591- 1597 (2018).  
<https://doi.org/10.1166/jno.2018.2392>
14. **S. Palei**, B. Parida, K. Kim, Oxidation Behavior with Quantum Dots Formation from Amorphous GaAs Thin Films, *Philosophical Magazine*, Taylor and Francis, 98, 33, 2965-2981 (2018). <https://doi.org/10.1080/14786435.2018.1512761>

## Curriculum Vitae

15. **S. Palei**, R. Sahu, J. Mun, K. Kim, Double GaAs/Si Heterojunction Si Solar Cells Fabricated by Electron Beam Evaporation, Journal of Nanoscience and Nanotechnology, American Scientific Publishers, 19, 3, 1368-1375 (2019). [doi:10.1166/jnn.2019.16229](https://doi.org/10.1166/jnn.2019.16229)
16. J. Mun, R. Sahu, **S. Palei**, K. Kim, Low Energy Effect of the Electron Beam Irradiation on Si Solar Cell, Journal of Nanoscience and Nanotechnology, American Scientific Publishers, 19, 3, 1574-1579 (2019). [doi:10.1166/jnn.2019.16236](https://doi.org/10.1166/jnn.2019.16236)
17. R Sahu, **S Palei**, J Choi, HY Ji, K Kim, Silicon solar cells with nitrogen-rich SiNx/Si interfacial passivation by low-energy nitrogen-ion implantation, Solar Energy Materials and Solar Cells 220, 110858 (2021).  
<https://doi.org/10.1016/j.solmat.2020.110858>
18. R. Sahu, **S. Palei**, K. Kim, Silicon Solar Cells with interfacial Passivation of the Highly Phosphorous-doped Emitter Surface by Oxygen Ion Implantation, Solar Energy Materials and Solar Cells 234, 111414 (2022).  
<https://doi.org/10.1016/j.solmat.2021.111414>
19. H. Kim, J. H. Seo, **S. Palei**, K. Seo, Solvent-Additive Coordination Effect on Lead-Iodide Precursor for Enlarging Grain Size of Perovskite Film, ACS Applied Energy Materials 5, 1, 27–34 (2022). [https://doi.org/10.1021/acsaem.1c03249 \(> 21%\)](https://doi.org/10.1021/acsaem.1c03249 (> 21%))
20. **S. Palei**, H. Kim, J. H. Seo, K. Seo, Quaternary Ammonium Halide-induced Stable Perovskite Films for Solar Cell Applications (Under review) (>20%).

## CONFERENCE AND PRESENTATIONS

1. Physics and technology of novel materials, 25<sup>th</sup>-27<sup>th</sup> February 2010, School of Physics, Sambalpur University, Odisha, India.
2. National Seminar on non-conventional energy and 28<sup>th</sup> convention of Odisha Physical Society, 12<sup>th</sup>-13<sup>th</sup> February 2011, School of Physics, Sambalpur University, Odisha. India.
3. Workshop on Awareness program: Medical and societal application of Nuclear Physics, 26<sup>th</sup> March 2010, School of Physics, Sambalpur University, Odisha. India
4. National seminar on recent trends in laser and Photonics, 9<sup>th</sup>-10<sup>th</sup> February 2013, Ravenshaw University, Cuttack, Odisha, India.
5. The Korean institute of electrical and electronic material engineers, 27<sup>th</sup> June 2014, Goseong, Republic of Korea.
6. NanoKorea, 2<sup>nd</sup>-4<sup>th</sup> July 2014, COEX, Seoul, Republic of Korea.

7. Global photovoltaic society, 10<sup>th</sup>-11<sup>th</sup> November 2014, Bexco, Busan, Republic of Korea.
8. Korean physical society, 22<sup>nd</sup>-24<sup>th</sup> April 2015, Daejeon convention center, Daejeon.
9. NanoKorea, 1<sup>st</sup>-3<sup>rd</sup> July 2014, COEX, Seoul, Republic of Korea.
10. International conference on advance electromaterials, 17th-20th November 2015, ICC, Jeju, Republic of Korea.
11. Korean physical society, 20<sup>th</sup>-22<sup>nd</sup> April 2016, Daejeon convention center, Daejeon, Republic of Korea.
12. The Korean institute of electrical and electronic material engineers summer, 22<sup>nd</sup> - 24<sup>th</sup> June 2016, hotel, Gyeongju. Republic of Korea.
13. NanoKorea, 13<sup>th</sup> -15<sup>th</sup> July 2016, Korea international exhibition, Goyang, Republic of Korea.
14. The Korean institute of electrical and electronic material engineers falls, 17<sup>th</sup> -18<sup>th</sup> November 2016, Mokpo University, Republic of Korea.
15. Global photovoltaic conference, 15<sup>th</sup>-17<sup>th</sup> March 2017, Kimdaejung convention center, Gwangju, Republic of Korea.
16. NanoKorea conference, 12<sup>th</sup>-14<sup>th</sup> July 2017, Korea international exhibition, Ilsan, Republic of Korea, Republic of Korea.
17. Korean Photovoltaic society, 30<sup>th</sup>-31<sup>st</sup> October 2017, Daejeon convention center, Daejeon, Republic of Korea.
18. International conference on advanced electromaterials, 21<sup>st</sup>-24<sup>th</sup> November 2017, Ramada Plaza hotel, Jeju (Oral Presentation), Republic of Korea.
19. Global photovoltaic conference, 14<sup>th</sup>-16<sup>th</sup> March 2018, Kimdaejung convention center, Gwangju (Oral Presentation), Republic of Korea.
20. Korean Physical Society, 25<sup>th</sup>-27<sup>th</sup> April 2018, Daejeon convention center 2017, Daejeon, Republic of Korea.
21. NanoKorea 2018, July 10-13, 2018, Korea international exhibition, Ilsan, Republic of Korea.
22. PVSEC-30 & GPVC-2020, November 8-13, 2020, ICC, Jeju, Republic of Korea.

**LIFE MEMBERS:**

1. Odisha Physical Society, 744
2. Solar Energy Society of India, LM/2359/2019
3. ORCID (Open Researcher and Contributor ID): 0000-0002-4149-599X

## **REFERENCES**

### **Prof. Keunjoo Kim**

Dept. of Mechanical Engineering  
Jeonbuk National University  
Jeonju-54896, Jeollabuk-do  
R. O. Korea  
Tel: (+82) 1062186249  
Email: [kimk@jbnu.ac.kr](mailto:kimk@jbnu.ac.kr)

### **Dr. Chapala Das**

Dept. of Physics  
Berhampur University  
Berhampur 760007  
Odisha, India  
E-Mail: [cd.phy@buodisha.edu.in](mailto:cd.phy@buodisha.edu.in)  
[chapaladas59@gmail.com](mailto:chapaladas59@gmail.com)  
Mob. +91 8637240860

### **Prof. Kwanyong Seo**

School of Energy and Chemical Engineering  
Ulsan National Institute of Science and Technology (UNIST)  
Ulsan-44919  
Republic of Korea  
E-mail:kseo@unist.ac.kr  
Mob: (+82) 1040782554

### **Dr. Banarji Behera**

School of Physics  
Sambalpur University  
Jyotivihar, Burla- 768019  
Odisha, India  
Tel: (+91) 9439223383  
Email:banarjibehera@gmail.com

### **Prof. Gauri Sankar Tripathi**

Dept. of Physics  
Berhampur University  
Berhampur 760007  
Odisha, India  
gst.phy@buodisha.edu.in  
gstripathi@gmail.com  
Mob: (+91) 9937188485

## **DECLARATION**

I hereby declare that the information given above is true to the best of my knowledge and belief.

Sincerely,



Srikanta Palei